

IN THE CLAIMS:

1. (currently amended) A computer-implemented method for sampling assets in an asset portfolio for optimal underwriting coverage when only a portion of the assets are to be underwritten, said method implemented using a computer coupled to a database, said method comprising the steps of:

determining descriptive attributes of assets in the portfolio;

encoding individual attributes; ~~and~~

clustering the assets for underwriting based upon occurrences of the descriptive attributes; and

utilizing the computer to determine a number of samples to be submitted for further underwriting review by:

establishing a confidence level regarding the total recoveries probable in each cluster of the portfolio,

establishing a precision to which total recoveries in each cluster are estimated,
and

providing an estimate of a level and a range of recoveries as a percentage of total Unpaid Principal Balance (UPB).

2. (canceled)

3. (canceled)

4. (currently amended) A method according to ~~Claim 3~~ Claim 1 wherein said step of establishing a confidence level regarding the total recoveries probable further comprises the step of determining a sample size, n , for the cluster of assets according to:

$$h^2 = k^2 \times n \left[1 - \frac{n}{N} \right] \times \frac{\left[\sum_{i=1}^N x_i \right]^2}{\left[\sum_{i=1}^n x_i \right]^2} \times \frac{\sum_{i=1}^N (y_i - Rx_i)^2}{N-1}$$

h = desired precision

n = sample size

N = cluster size

x_i = UPB for sample i

y_i = recovery for sample i

$$R = \frac{\sum_{i=1}^N y_i}{\sum_{i=1}^N x_i} = \text{cluster expected recovery \%}$$

h = error tolerance for estimating $Y = \sum_{i=1}^N y_i$ with \hat{Y}_R

and solving for n .

5. (original) A method according to Claim 4 wherein said step of providing an estimate of a level and a range of recoveries further comprises the step of estimating a level and range of recoveries according to:

$$\hat{Y}_R = \hat{R} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n \rho_i x_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i$$

k = constant in Tchebyshev's Formula :

$$\left| \hat{Y}_R - \mu_{\hat{Y}_R} \right| \leq k \sqrt{\text{Var}(\hat{Y}_R)} \text{ with probability } \geq 1 - \frac{1}{k^2}$$

6. (original) A method according to Claim 1 wherein said step of clustering the assets for underwriting further comprises the step of using a supervised clustering process to cluster the assets.

7. (original) A method according to Claim 1 wherein said step of clustering the assets for underwriting further comprises the step of using an unsupervised clustering process to cluster the assets.

8. (original) A method according to Claim 1 wherein said step of clustering the assets for underwriting further comprises the step of using a Monte Carlo process to cluster the assets.

9. (currently amended) A system configured to sample assets in an asset portfolio for optimal underwriting coverage, said system comprising:

a computer configured as a server and further configured with a database of asset portfolios and to enable valuation process analytics;

at least one client system connected to said server through a network, said server further configured to:

determine descriptive attributes of assets in the portfolio;

encode individual attributes; ~~and~~

cluster the assets for underwriting based upon occurrences of the descriptive attributes;

and

determine a number of samples to be submitted for further underwriting review by:

establishing a confidence level regarding the total recoveries probable in each cluster of the portfolio,

establishing a precision to which total recoveries in each cluster are estimated,
and

providing an estimate of a level and a range of recoveries as a percentage of total Unpaid Principal Balance (UPB).

10. (canceled)

11. (canceled)

12. (currently amended) A system according to ~~Claim 11~~ Claim 9 wherein said server configured to determine a sample size, n , for the cluster of assets according to:

$$h^2 = k^2 \times n \left[1 - \frac{n}{N} \right] \times \frac{\left[\sum_{i=1}^N x_i \right]^2}{\left[\sum_{i=1}^n x_i \right]^2} \times \frac{\sum_{i=1}^N (y_i - R x_i)^2}{N-1}$$

h = desired precision

n = sample size

N = cluster size

x_i = UPB for sample i

y_i = recovery for sample i

$$R = \frac{\sum_{i=1}^N y_i}{\sum_{i=1}^N x_i} = \text{cluster expected recovery \%}$$

h = error tolerance for estimating $Y = \sum_{i=1}^N y_i$ with \hat{Y}_R

by solving for n .

13. (original) A system according to Claim 12 wherein said server configured to estimate a level and range of recoveries according to:

$$\hat{Y}_R = \hat{R} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n \rho_i x_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i$$

k = constant in Tchebyshev's Formula :

$$\left| \hat{Y}_R - \mu_{\hat{Y}_R} \right| \leq k \sqrt{\text{Var}(\hat{Y}_R)} \text{ with probability } \geq 1 - \frac{1}{k^2}.$$

14. (original) A system according to Claim 9 wherein said server configured to use a supervised clustering process to cluster the assets.

15. (original) A system according to Claim 9 wherein said server configured to use an unsupervised clustering process to cluster the assets.

16. (original) A system according to Claim 9 wherein said server configured to use a Monte Carlo process to cluster the assets.

17. (currently amended) A computer for sampling assets in an asset portfolio for optimal underwriting coverage, said computer including a database of asset portfolios and valuation process analytics, said computer programmed to:

determine descriptive attributes of assets in the portfolio;

encode individual attributes; ~~and~~

cluster the assets for underwriting based upon occurrences of the descriptive attributes;

and

determine a number of samples to be submitted for further underwriting review by:

establishing a confidence level regarding total recoveries probable in each cluster of the portfolio,

establishing a precision to which total recoveries in each cluster are estimated,
and

providing an estimate of a level and a range of recoveries as a percentage of total Unpaid Principal Balance (UPB).

18. (canceled)

19. (canceled)

20. (currently amended) A computer according to ~~Claim 19~~ Claim 17 programmed to determine a sample size, n , for the cluster of assets according to:

$$h^2 = k^2 \times n \left[1 - \frac{n}{N} \right] \times \frac{\left[\sum_{i=1}^N x_i \right]^2}{\left[\sum_{i=1}^n x_i \right]^2} \times \frac{\sum_{i=1}^N (y_i - R x_i)^2}{N-1}$$

h = desired precision

n = sample size

N = cluster size

x_i = UPB for sample i

y_i = recovery for sample i

$$R = \frac{\sum_{i=1}^N y_i}{\sum_{i=1}^N x_i} = \text{cluster expected recovery \%}$$

h = error tolerance for estimating $Y = \sum_{i=1}^N y_i$ with \hat{Y}_R

by solving for n .

21. (original) A computer according to Claim 20 programmed to estimate a level and range of recoveries according to:

$$\hat{Y}_R = \hat{R} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n y_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i = \frac{\sum_{i=1}^n \rho_i x_i}{\sum_{i=1}^n x_i} \times \sum_{i=1}^N x_i$$

k = constant in Tchebyshev's Formula :

$$\left| \hat{Y}_R - \mu_{\hat{Y}_R} \right| \leq k \sqrt{\text{Var}(\hat{Y}_R)} \text{ with probability } \geq 1 - \frac{1}{k^2}.$$

22. (original) A computer according to Claim 17 programmed to use a supervised clustering process to cluster the assets.

23. (original) A computer according to Claim 17 programmed to use an unsupervised clustering process to cluster the assets.

24. (original) A computer according to Claim 17 programmed to use a Monte Carlo process to cluster the assets.